Amendments to the Claims

Amendments to the claims are reflected in the following listing of claims.

Listing of Claims:

1-55 (Previously Cancelled)

56. (Previously Presented) A method of identifying differences between biopolymers, the method comprising the steps:

a) providing at least one pair of different sets of labeled detector molecules wherein the different sets of labeled detector molecules of one pair are specifically bondable to a certain region in said biopolymers; and the labels of the one set of labeled detector molecules of said one pair differs from the labels of another one set of labeled detector molecules of said one pair;

b) exposing said labeled detector molecules to said biopolymers under conditions permitting bonding reactions to occur between said labeled detector molecules and said biopolymers; wherein said one set of labeled detector molecules of said one pair binds to a certain region of the biopolymer overlapping with the certain region bound by said another one set of labeled detector molecules of said one pair;

c) recording the presence, intensity and intensity ratios of the labeled detector molecules at selected regions of said biopolymers by scanning the biopolymers in longitudinal direction using a scanning device;

d) evaluating the recorded intensities and intensity ratios, whereby the biopolymer is divided into a number of sections and by means of an appropriate calculation program, a false color is assigned to each of these sections based on the relative intensity ratios; and

e) identifying differences between said biopolymers by comparing the result to that obtained for a different biopolymer, wherein the bonded labeled detector molecules of one set display a continuously changing label-signal intensity along the longitudinal direction of the biopolymer.

57. (Previously Presented) The method of claim 56, wherein the bonded labeled detector molecules of each of the different sets of one pair display a continuously changing label-signal intensity along the longitudinal direction of the biopolymer.

58. (Previously Presented) The method of claim 57, wherein the displayed continuously changing label-signal intensity along the longitudinal direction results from a continuously changing concentration of each of the different sets of bonded labeled detector molecules of one pair along the longitudinal direction of the biopolymer.

59. (Cancelled)

60. (Previously Presented) The method of claim 58, wherein the continuously changing concentration of each of the different sets of bonded labeled detector molecules of one pair is distributed along the longitudinal direction in a Gaussian distribution.

61. (Previously Presented) The method of claim 56, wherein the biopolymers are immobilized at least before step (b).

62. (Previously Presented) The method of claim 61, wherein the biopolymers are immobilized on a carrier or in a matrix.

63. (Previously Presented) The method of claim 56, wherein said bonding reactions between each of said labeled detector molecules and said biopolymer are carried out simultaneously or successively.

64. (Previously Presented) The method of claim 56, wherein said bonding reaction in step (b)

is selected from the group consisting of a nucleic acid hybridization and an antigen/antibody reaction.

65. (Previously Presented) The method of claim 64, wherein said nucleic acid hybridization is an *in situ* hybridization.

66. (Previously Presented) The method of claim 56, wherein said biopolymers are selected from the group consisting of nucleic acids and polypeptides.

67. (Previously Presented) The method of claim 66, wherein said nucleic acids are DNA or RNA.

68. (Previously Presented) The method of claim 66, wherein said nucleic acids are chromosomal DNA.

69. (Previously Presented) The method of claim 56, wherein the labeled detector molecules are selected from the group consisting of nucleic acids and antibodies.

70. (Previously Presented) The method of claim 69, wherein said different nucleic acids are selected from different chromosome region-specific DNA libraries.

71. (Previously Presented) The method of claim 56, wherein the label comprises a fluorescent dye.

72. (Previously Presented) The method of claim 56, wherein said step (a) further comprises providing at least one set of a localized calibrating probe, said probe comprising calibrating

labels.

73. (Previously Presented) The method of claim 72, wherein said calibrating labels comprise all of said labels of said labeled detector molecules of the different sets of at least one pair.

74. (Previously Presented) The method of claim 56, wherein said step (a) further comprises providing a number of localized calibrating probes, said number being one less than the total number of said labels in said labeled detector molecules, each of said probes comprising two labels; and said step (d) further comprises correcting registration errors between individual images corresponding to individual labels, said registration errors being introduced by changing filters between the acquisition of said individual images; said correcting step being achieved by pairwise comparison of the positions of the two labels of said calibrating probes.

75. (Previously Presented) The method of claim 74, wherein said step (a) further comprises providing a plurality of said calibrating probes; and said step (d) further comprises correcting positional transformations of said bondings by comparison of the position of the labels of said calibrating probes.

76. (Previously Presented) The method of claim 74, wherein said step (d) further comprises forming images of said biopolymers; and aligning said images with respect to said bondings, thereby providing positional correction for said bondings.

77. (Previously Presented) The method of claim 75, wherein said step of correcting is automatic.

78. (Previously Presented) The method of claim 75, wherein said labels of said calibrating

probes have known or reproducible constant intensity whereby the signal intensities of all of said labels can be standardized.

79. (Previously Presented) The method of claim 78, wherein said calibrating probes are fluorescence-labeled probes.

80. (Previously Presented) The method of claim 78, wherein said calibrating probes are fluorescence-labeled particles.

81. (Previously Presented) The method of claim 76, wherein said calibrating probes are used for positional correction of said bondings.

82. (Previously Presented) A method of identifying differences between biopolymers, the method comprising the steps:

a) providing at least two different sets of labeled detector molecules wherein at least two sets of said labeled detector molecules at a time are specifically bondable to a certain region in said biopolymers; and the labels of said labeled detector molecules of one of said at least two sets differ from the labels of said labeled detector molecules of another of said at least two sets;

b) exposing said labeled detector molecules to said biopolymers under conditions permitting bonding reactions to occur between said labeled detector molecules and said biopolymers; wherein the labeled detector molecules of said one of said at least two sets binds to a certain region of the biopolymer overlapping with the certain region bound by said labeled detector molecules of another of said at least two sets;

c) recording the presence, intensity and intensity ratios of the labeled detector

molecules at selected regions of said biopolymers by scanning the biopolymers in longitudinal direction using a scanning device;

d) evaluating the recorded intensities and intensity ratios, whereby the biopolymer is divided into a number of sections and by means of an appropriate calculation program, a false color is assigned to each of these sections based on the relative intensity ratios; and

e) identifying differences between said biopolymers by comparing the result to that obtained for a different biopolymer, wherein the bonded labeled detector molecules of one set display a continuously changing label-signal intensity along the longitudinal direction of the biopolymer.

83. (Previously Presented) The method of claim 82, wherein the bonded labeled detector molecules of each of the different sets display a continuously changing label-signal intensity along the longitudinal direction of the biopolymer.

84. (Previously Presented) The method of claim 83, wherein the displayed continuously changing label-signal intensity along the longitudinal direction results from a continuously changing concentration of each of the different sets of bonded labeled detector molecules along the longitudinal direction of the biopolymer.

85. (Cancelled)

86. (Previously Presented) The method of claim 84, wherein the continuously changing concentration of each of the different sets of bonded labeled detector molecules is distributed along the longitudinal direction in a Gaussian distribution.

87. (Previously Presented) The method of claim 82, wherein the biopolymers are immobilized

at least before step (b).

88. (Previously Presented) The method of claim 87, wherein the biopolymers are immobilized on a carrier or in a matrix.

89, (Previously Presented) The method of claim 82, wherein said bonding reactions between each of said labeled detector molecules and said biopolymer are carried out simultaneously or successively.

90. (Previously Presented) The method of claim 82, wherein said bonding reaction in step (b) is selected from the group consisting of nucleic acid hybridization and an antigen/antibody reaction.

91. (Previously Presented) The method of claim 90, wherein said nucleic acid hybridization is an *in situ* hybridization.

92. (Previously Presented) The method of claim 82, wherein said biopolymers are selected from the group consisting of nucleic acids and polypeptides.

93. (Previously Presented) The method of claim 92, wherein said nucleic acids are DNA or RNA.

94. (Previously Presented) The method of claim 82, wherein said nucleic acids are chromosomal DNA.

95. (Previously Presented) The method of claim 82, wherein the labeled detector molecules

are nucleic acids or antibodies.

96. (Previously Presented) The method of claim 95, wherein said different nucleic acids are selected from different chromosome region-specific DNA libraries.

97. (Previously Presented) The method of claim 82, wherein the label comprises a fluorescent dye.

98. (Previously Presented) The method of claim 82, wherein said step (a) further comprises providing at least one set of a localized calibrating probe, said probe comprising calibrating labels.

99. (Previously Presented) The method of claim 88, wherein said calibrating labels comprise all of said labels of said labeled detector molecules of the different sets.

100. (Previously Presented) The method of claim 82, wherein said step (a) further comprises providing a number of localized calibrating probes, said number being one less than the total number of said labels in said labeled detector molecules, each of said probes comprising two labels; and said step (d) further comprises correcting registration errors between individual images corresponding to individual labels, said registration errors being introduced by changing filters between the acquisition of said individual images; said correcting step being achieved by pairwise comparison of the positions of the two labels of said calibrating probes.

101. (Previously Presented) The method of claim 100, wherein said step (a) further comprises providing a plurality of said calibrating probes; and said step (d) further comprises correcting positional transformations of said bondings by comparison of the position of the labels of said

calibrating probes.

102. (Previously Presented) The method of claim 100, wherein said step (d) further comprises forming images of said biopolymers; and aligning said images with respect to said bondings, thereby providing positional correction for said bondings.

103. (Previously Presented) The method of claim 101, wherein said step of correcting is automatic.

104. (Previously Presented) The method of claim 101, wherein said labels of said calibrating probes have known or reproducible constant intensity whereby the signal intensities of all of said labels can be standardized.

105. (Previously Presented) The method of claim 104, wherein said calibrating probes are fluorescence-labeled probes.

106. (Previously Presented) The method of claim 102, wherein said calibrating probes are fluorescence-labeled particles.

107. (Previously Presented) The method of claim 102, wherein said calibrating probes are used for positional correction of said bondings.